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incorporated

Point of Care Informatics

www.ekosystems.com

Electronic Medical Record Systems

Changing the Practice of Medicine

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Electronic Medical Record Systems Changing the Practice of Medicine

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- ## Jim Edmiston
  - Chief Technical Officer: eko systems, Fairfax VA

- ## Company Profile
  - Started in 1996
  - Beta Site
    - 35 anesthetizing locations and 62 PACU nodes
    - 200+ care providers using EMRS
  - All surgical case types:
    - Cardiac, Transplant, Trauma, OB, Neuro, Out Patient
  - Over 120,000 patients have been charted electronically

Healthcare Overview

Today: Current healthcare industry infrastructure suffers from deeply entrenched paper-driven processes which limit access to information and hampers the ability to manage, monitor, or re-engineer clinical and business processes.

Re-stated: Hospitals use paper forms in acute clinical care areas. Hospitals use computers for traditional IS functions.

Tomorrow: The medical record, and the data contained within, *will have to be* the source document that drives core business and clinical processes in the health care industry due to the decrease in reimbursements and increase in regulations.

Re-stated: The acquisition, control, dissemination and use of information will revolutionize the healthcare industry within the next 10 years.

Internal Forces of Change

- 75% of patient costs incurred in first 24 hours – majority in HAC

- Over 99% of hospitals in the US today use manual charting and handwritten forms in high acuity care settings

- Hospitals are moving to outsourced IT model
  - 81% are outsourcing key IT functions (HIMSS survey) vs. 66% in 1998. Trend continues for 1999 and 2000.

- Hospitals are aggressively moving to computer-based patient record systems
  - 53% have begun to plan/implement such systems (HIMSS survey)

- Recognize charge leakage results in significant loss of revenues

Regulatory Forces of Change

- HCFA Activities
  - HCFA has delineated documentation requirements that must be met to qualify a claim for reimbursement.
  - HCFA has allocated increased resources to audit submitted claims
  - There is a new body of federal law that can be used to impose fines and penalties on institutions and individuals who submit claims that fail to meet documentation requirements

- Health Insurance Portability and Accountability Act (HIPAA)
  - Covers fraud of any healthcare benefit program
  - Expanded Authority to HCFA to perform fraud audits
  - Increased monetary fines to $10,000 per incident.
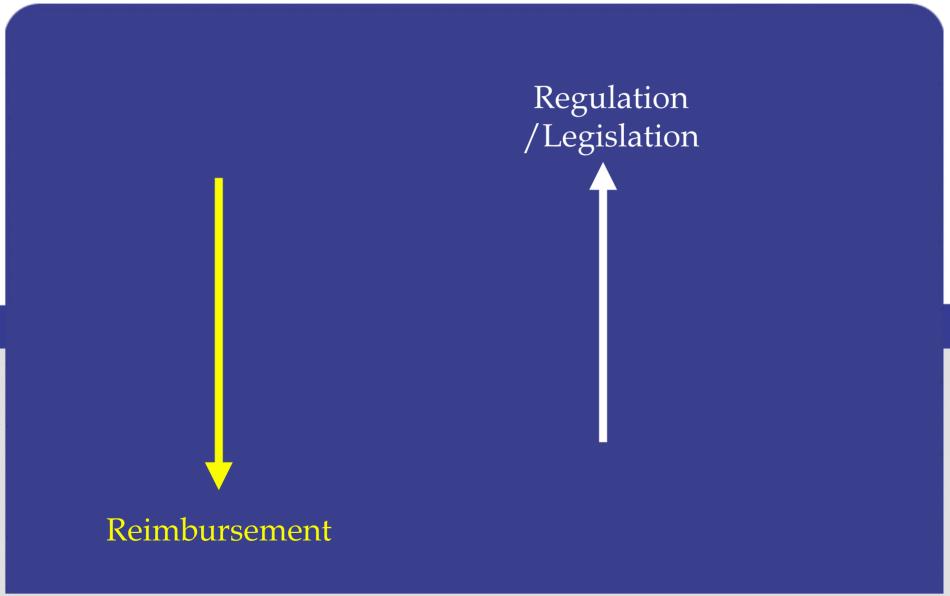 - Increased security measures.

Regulatory Forces of Change

- Omnibus Reconciliation Act of 1993 (OBRA)
  - Prevents paper-based claims from being paid in less than 27 days
  - Allows electronic-based claims to be paid after 14 days
  - Electronic transmission of funds available to those who file 90% electronically.

- JCAHO Activities
  - ORYX initiative
    - Organizations must enroll in outcomes tracking.
    - Computerization is critical if healthcare organizations are to comply.
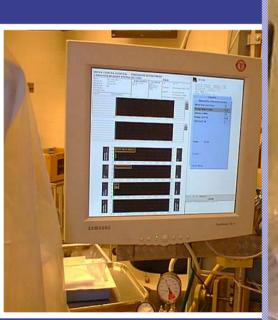
Why Healthcare Must Embrace Automation - Restated

Regulation /Legislation

Reimbursement

Glossary

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- Anesthesiologist is the party responsible for making the legal medical record of care for what happens in an Operating Room.

- High acuity care (HAC) - includes operating rooms (OR), post-anesthesia recovery unit (PACU), emergency rooms (ER), labor and delivery rooms (LDR), and ICUs.
  - Clinician's tasks:
    - Patient care task load is high and can have saturation peaks
    - Device management
    - Charting task load is high frequency, many data types

- Virtual Record: *Frontiers* replaces the paper version of the medical record and all the business processes that surround it with an electronic version (or virtual) of the record. The data on the record is stored in a database and a web-based interface is built around it that is used to provide the business processes (or billing). In addition, this web-based application provides standard reports and access to the stored record so that the clinicians can use the data to improve patient care.

Frontiers
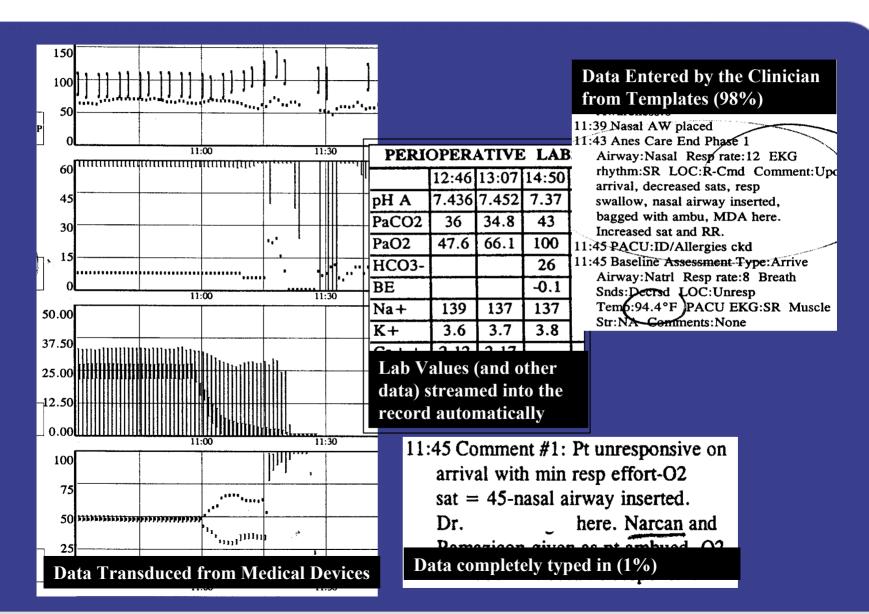# An Electronic Medical Record System

Electronic Medical Record
What is it?

Data Entered by the Clinician from Templates (98%)

11:39 Nasal AW placed
11:43 Anes Care End Phase 1
  Airway:Nasal Resp rate:12 EKG rhythm:SR LOC:R-Cmd Comment:Upo arrival, decreased sats, resp swallow, nasal airway inserted, bagged with ambu, MDA here. Increased sat and RR.
11:45 PACU:ID/Allergies ckd
11:45 Baseline Assessment Type:Arrive
  Airway:Natrl Resp rate:8 Breath Snds:Decrsd LOC:Unresp
  Temp:94.4°F PACU EKG:SR Muscle Str:NA Comments:None

PERIOPERATIVE LAB

	12:46	13:07	14:50
pH A	7.436	7.452	7.37
PaCO2	36	34.8	43
PaO2	47.6	66.1	100
HCO3-			26
BE			-0.1
Na+	139	137	137
K+	3.6	3.7	3.8

Lab Values (and other data) streamed into the record automatically

11:45 Comment #1: Pt unresponsive on arrival with min resp effort-O2 sat = 45-nasal airway inserted. Dr. _____ here. Narcan and

Data Transduced from Medical Devices

Data completely typed in (1%)

Frontiers Overview

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- Front End - *creates the medical record*
  - Clinical Data Collection <u>Network</u>
    - Secure and intuitive clinical user interface (GUI)
    - Device interface
    - Clinical Templates
  - Virtual record
  - Printed medical record
- <u>Back End</u> - *manages the data / business processes*
  - Data Scrubbing
  - Database for <u>all</u> electronic records
  - Electronic Archive
  - Software modules for charge generation / reports
  - Interface Engine
  - Information access (queries)

Together, they form
the EMR System

Electronic Medical Record Systems: The Information Value Proposition

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- Level I   Infrastructure Re-engineering
  - Charge capture
  - Non-clinical FTE reallocation

Business applications

- Level II   Business Process Management
  - Compliance auditing
  - Process Improvement / Cost accounting
  - Throughput management
  - Logistics support
- Level III   Care Management
  - Standardization of charting, document quality
  - Enhanced care provider situational awareness
  - Performance Improvement / Care variance auditing
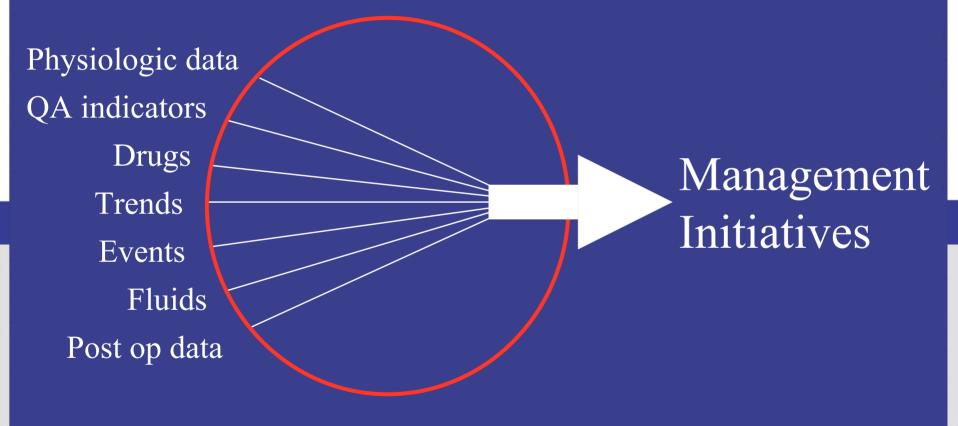 - Standardization of care / Benchmarking
  - Outcomes measurement / management

Clinical applications

Level III ROI
Performance Improvement Process

Indicators ➡ Refereeing ➡ Collating ➡ Action Items

Physiologic data
QA indicators
Drugs
Trends
Events
Fluids
Post op data

Management
Initiatives

Summary

- Electronic Medical Record Systems (EMRS) greatly enable the ability to develop, monitor and manage care plans and performance improvement programs

- The "new" technology-based infrastructure replaces the "old" paper system

- Industry must determine if it wants monolithic or distributed solutions.

Summary

- The IT Platform assumes "mission critical" status if the effort is made

- eko systems has standardized on Sun Hardware & Software Solutions because of these requirements:
  - maximum uptime
  - high-performance
  - reliability/scalability
  - remote maintenance
  - technology innovations